

Appl. No. 09/801,602  
Amdt. Dated January 19, 2006  
Reply to Office Action of October 19, 2005

**Listing of Claims:**

1. (Currently Amended) A method for simultaneously developing a family of complex systems having a common software architecture platform, the family of complex systems including a plurality of complex systems, the method comprising:

constructing an initial requirements object model which explains abstract concepts in terms of a structured vocabulary,

forming an initial set of use cases based on the initial requirements object model such that the use cases are expressed using the structured vocabulary of the requirements object model, the use cases describing interaction of users with each of said complex systems in terms of the structured vocabulary explaining the abstract concepts;

forming an initial functional requirements specification (FRS) which includes use cases,

forming an amended requirements object model based on the initial FRS and thus in consideration of the initial set of use cases,

forming additional use cases based on analysis of the amended requirements object model,

changing the FRS in light of the additional use cases,

forming another amended requirements object model based on the changed FRS simultaneously with the formation of the additional use cases, and

repeating the additional use case formation step, the FRS changing step and the amended requirements object model formation step until all desired use cases have been formed and considered, and

obtaining a final requirements object model once all of the desired use cases have been considered, and

expressing differences between members of the family in the requirements object models.

2. (Previously Presented) A method as claimed in Claim 1, wherein

Appl. No. 09/801,602  
Amdt. Dated January 19, 2006  
Reply to Office Action of October 19, 2005

the functional requirements specification (FRS) includes one or more chapters, further comprising:

- establishing one or more FRS authoring teams for separate chapters,
- designating a single object model control team to control internal consistency of the requirements object models,
- forming one or more overlapping modeling teams where each modeling team includes members of the object model control team together with one or more members of respective FRS authoring teams, and
- providing that overlapping modeling teams for their chapters construct use cases and provide respective portions of the structured vocabulary.

3. (Currently Amended) A method as claimed in claim 1, wherein the differences between members of the family are expressed in the requirements object models using one or more of the following mechanisms:

specialization, wherein the differences between members of the family are expressed using subclasses of a generalized class,

multiplicity, wherein the differences between members of the family are expressed using different multiplicities in relationships between classes, and

attribution, wherein the differences between members of the family are expressed using different values for an attribute of a class.

4. (Previously Presented) A method as claimed in Claim 2, further comprising:  
constructing the initial requirements object model in at least one of the modeling teams,  
performing the FRS authoring of the use cases on the basis of the initial model,  
and  
performing fine tuning of the use cases by the object model control team.

Appl. No. 09/801,602  
Amdt. Dated January 19, 2006  
Reply to Office Action of October 19, 2005

5. (Previously Presented) A method as claimed in Claim 2, further comprising carrying out FRS authoring of the use cases of several chapters in parallel by the respective FRS authoring teams.

6. (Original) A method as claimed in Claim 1, wherein the complex systems are medical diagnostic imaging systems, notably, diagnostic x-ray examination systems.

7. (Previously Presented) A family of complex systems, notably a family of medical imaging systems, obtained by the method of claim 1, wherein separate complex systems support respective, different subsets of the use cases.

8. (Previously Presented) A method as claimed in Claim 1, where the precise behavior of one or more use cases differs among members of the family according to variations expressed in the object model, notably by different subclasses of a general class, by different multiplicities of relationships, or by different values of attributes.

9. (Previously Presented) A method as claimed in Claim 1, further comprising the step of expressing differences between members of the family in the requirements object models using at least one of the following mechanisms:

different members of the family are expressed using different subclasses of a generalized class,

different members of the family are expressed using different multiplicities in relationships between classes, and

different members of the family are expressed using different values for an attribute of a class.

10. (Cancelled)

11. (Previously Presented) A method as claimed in Claim 1, further comprising analyzing the requirements object models to identify difficulties and shortcomings, the

Appl. No. 09/801,602  
Amdt. Dated January 19, 2006  
Reply to Office Action of October 19, 2005

requirements object models being amended in light of the identified difficulties and shortcomings.

12. (Cancelled)

13. (Previously Presented) A method as claimed in Claim 1, further comprising considering the functional requirements specification complete when all of the use cases are expressed in the structured vocabulary of the final requirements object model.

14. (Previously Presented) A method as claimed in Claim 1, wherein since the additional use cases are formed simultaneous with the formation of the amended requirements object models, the amended requirements object models are thereby formed during the formation of the functional requirements specification.

15. (Cancelled)

16. (Previously Presented) A method as claimed in claim 1, wherein the use cases are formed using only the structured vocabulary of the requirements object models.

17. (Previously Presented) A method as claimed in claim 1, wherein formation of the amended requirements object models comprises changing the structured vocabulary.

18. (Previously Presented) A method as claimed in claim 1, wherein the use cases are expressed in natural language.